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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/631,123

07/31/2003

Christopher Ware

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2473

7590

01/26/2005

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EXAMINER

DAVIS, CYNTHIA L

ART UNIT

PAPER NUMBER

2665

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,123

Applicant(s)

WARE ET AL.

Examiner

Cynthia L Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/31/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Kumar.

Regarding claim 1, transmitting a first poll from said base station to a first user terminal traffic stream is disclosed in Lee, column 3, lines 48-50. Transmitting a first frame from said first user terminal traffic stream to said base station in response to said first poll, wherein a queue state of said first user terminal traffic stream is indicated in a header of said first frame is not specifically disclosed in Lee, however, Lee does disclose that the base station learns of the queue state of each user terminal in column 3, lines 50-52. It would have been obvious to one skilled in the art at the time of the invention to transmit the queue state of the user stations in the header of the first frame. The motivation would be to send the queue state first, so that scheduling can be done before any other information is sent. Removing said first user terminal traffic stream from an active list when said first frame indicates that said queue state is empty is disclosed in column 3, lines 50-52. Scheduling transmissions of data frames between said base station and said plurality of user terminal traffic streams that remain on said active list is disclosed in column 3, lines 52-61. Returning said first user terminal traffic

stream to said active list at the expiration of said deferral window is disclosed in Lee, column 3, lines 48-68 (the process is repeated once the deferral window expires, all the stations are returned to the active list at the end). Calculating a deferral window is missing from Lee. However, Lee does disclose in column 3, lines 53-54, a latency period, which is a design parameter, not a calculated parameter. Kumar discloses this in figure 8, element 801. It would have been obvious to one skilled in the art at the time of the invention to calculate the deferral window instead of setting it as a design parameter as is done in Lee. The motivation would be to make the system more responsive to changes in traffic flow.

Regarding claim 8, a plurality of user terminal traffic streams is disclosed in Lee, figure 1, elements 12. A base station is disclosed in Lee, figure 1, elements 11 and 13. The base station transmitting a first poll from said base station to a first user terminal traffic stream is disclosed in Lee, column 3, lines 48-50. Transmitting a first frame from said first user terminal traffic stream to said base station in response to said first poll, wherein a queue state of said first user terminal traffic stream is indicated in a header of said first frame is not specifically disclosed in Lee, however, Lee does disclose that the base station learns of the queue state of each user terminal in column 3, lines 50-52. It would have been obvious to one skilled in the art at the time of the invention to transmit the queue state of the user stations in the header of the first frame. The motivation would be to send the queue state first, so that scheduling can be done before any other information is sent. Removing said first user terminal traffic stream from an active list when said first frame indicates that said queue state is empty is disclosed in column 3,

lines 50-52. Scheduling transmissions of data frames between said base station and said plurality of user terminal traffic streams that remain on said active list is disclosed in column 3, lines 52-61. Returning said first user terminal traffic stream to said active list at the expiration of said deferral window is disclosed in Lee, column 3, lines 48-68 (the process is repeated once the deferral window expires, all the stations are returned to the active list at the end). Calculating a deferral window is missing from Lee. However, Lee does disclose in column 3, lines 53-54, a latency period, which is a design parameter, not a calculated parameter. Kumar discloses this in figure 8, element 801. It would have been obvious to one skilled in the art at the time of the invention to calculate the deferral window instead of setting it as a design parameter as is done in Lee. The motivation would be to make the system more responsive to changes in traffic flow.

Regarding claim 15, a plurality of user terminal traffic streams is disclosed in Lee, figure 1, element 12. A base station is disclosed in Lee, figure 1, element 11 (the satellite acts as a base station). Means for transmitting a first poll from said base station to a first user terminal traffic stream is disclosed in Lee, column 3, lines 48-50. Means for transmitting a first frame from said first user terminal traffic stream to said base station in response to said first poll, wherein a queue state of said first user terminal traffic stream is indicated in a header of said first frame is not specifically disclosed in Lee, however, Lee does disclose that the base station learns of the queue state of each user terminal in column 3, lines 50-52. It would have been obvious to one skilled in the art at the time of the invention to transmit the queue state of the user

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stations in the header of the first frame. The motivation would be to send the queue state first, so that scheduling can be done before any other information is sent. Means for removing said first user terminal traffic stream from an active list when said first frame indicates that said queue state is empty is disclosed in column 3, lines 50-52.

Means for scheduling transmissions of data frames between said base station and said plurality of user terminal traffic streams that remain on said active list is disclosed in column 3, lines 52-61. Means for returning said first user terminal traffic stream to said active list at the expiration of said deferral window is disclosed in Lee, column 3, lines 48-68 (the process is repeated once the deferral window expires, all the stations are returned to the active list at the end). Means for calculating a deferral window , and the deferral window being calculated using an algorithm based on the following equation:

$$T_o = T_i, L_i / p_i > T_{db}$$

$$T_o = T_s, \text{ otherwise}$$

where T_i is an interval selected by a deferral window adaptation algorithm, T_{db} is a requested delay bound, L_i is a nominal data frame size, p_i is a mean data transfer rate, F , is a scheduling window, and F_s is the duration of said deferral window is missing from Lee. However, Lee does disclose in column 3, lines 53-54, a latency period, which is a design parameter, not a calculated parameter. Further, Kumar discloses in column 5, line 60 (equation 1) an equation for the polling interval that is based upon packet size and transfer rate. It would have been obvious to one skilled in the art at the time of the invention to base the deferral window on these parameters. The motivation would be to have the deferral window relate to the traffic flow in the system.

Regarding claims 2 and 9, the deferral window being calculated using an algorithm based on the following equation:

$$T_o = T_i, L_i / p_i > T_{db}$$

$$T_o = T_s, \text{ otherwise}$$

where T_i is an interval selected by a deferral window adaptation algorithm, T_{db} is a requested delay bound, L_i is a nominal data frame size, p_i is a mean data transfer rate, F , is a scheduling window, and F_s is the duration of said deferral window is missing from Lee. However, Kumar discloses in column 5, line 60 (equation 1) an equation for the polling interval that is based upon packet size and transfer rate. It would have been obvious to one skilled in the art at the time of the invention to base the deferral window on these parameters. The motivation would be to have the deferral window relate to the traffic flow in the system.

Regarding claims 3, 10, and 16, T_i being calculated using an algorithm based on the following equation:

$$T_i = T_i - (T_w - T_q) + \square$$

where T_w is the average time between a first in line data frame arrival point in a user terminal traffic stream queue and the arrival of a first poll since a previous return of said user terminal traffic stream to said active list, T_q is the average time between the return of said user terminal traffic stream to said active list and the scheduled transmission of a next poll, and \square is a heuristic factor based on the inter-arrival period variance of an uplink traffic stream is missing from Lee. However, Kumar discloses in column 6, line 3 an equation for the polling interval that is based subtracting the inverse of the service

rate (i.e., the time between transmissions) from the maximum bandwidth. It would have been obvious to one skilled in the art at the time of the invention to base the deferral window on these parameters. The motivation would be to have the deferral window relate to the traffic flow in the system.

Regarding claims 4 and 11, the deferral window being calculated based on a defined inter-arrival period of a user terminal traffic stream is missing from Lee. However, Kumar discloses in column 5, line 60 (equation 1) calculating the polling interval based on the service rate. It would have been obvious to one skilled in the art at the time of the invention to base the deferral window on these parameters. The motivation would be to have the deferral window relate to the traffic flow in the system.

Regarding claims 5 and 12, the inter-arrival period corresponds to a period between voice or video data frames generated by a codec is missing from Lee. However, Kumar discloses in column 11, lines 5-20, scheduling for voice. It would have been obvious to one skilled in the art at the time of the invention to schedule for voice. The motivation would be to be able to use the system for voice transmissions.

Regarding claims 6, 13, and 17, the step of scheduling transmission of other data frames between said base station and said plurality of user terminal traffic streams that remain on said active list includes calculating individual traffic stream delays based on the elapsed time since the most recent channel access opportunity of each user terminal traffic stream in said plurality of user terminal traffic streams is missing from Lee. However, Kumar discloses in column 6, lines 26-63, scheduling to meet deadlines, which would be based on the tolerated delays in the data streams. It would have been

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obvious to one skilled in the art at the time of the invention to schedule based on calculated delays. The motivation would be to minimize delays and thereby guarantee a certain QoS.

Regarding claims 7, 14, and 18, the step of scheduling transmissions of other data frames between said base station and said plurality of user terminal traffic streams that remain on said active list is performed based on agreed to Quality of Service (QoS) requirements is missing from Lee. Kumar discloses in column 6, lines 14-16, using QoS requirements in its system. It would have been obvious to one skilled in the art to schedule for QoS. The motivation would be to be able to guarantee a certain QoS to whichever users need it.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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